

ABSTRACT OF THE DISCLOSURE

Methods and devices are disclosed utilizing a silicon-containing barrier layer. A method of forming a barrier layer on a semiconductor device is disclosed. A semiconductor device is provided. A silicon-containing material is deposited on the semiconductor device. The silicon-containing material is processed in a reactive ambient. The barrier layer can be made primarily oxide, primarily nitride or both by the reactive ambient selected. A semiconductor device is disclosed. The semiconductor device includes a substrate, a gate oxide, a silicon-containing barrier layer and a gate electrode. The gate oxide is formed over the substrate. The silicon-containing barrier layer is formed over the gate oxide by causing silicon atoms of a precursor layer react with a reactive agent. The gate electrode is formed over the silicon-containing barrier layer. Other embodiments utilizing a barrier layer are disclosed.